

L 56456-65

ACCESSION NR: AP5018807

ASSOCIATION: none

SUBMITTED: 00

NO REF SOV: 002

ENCL: 00

OTHER: 000

SUB CODE: MM, TD

JPRS

Card

182  
4/4

SHUL'TE, Yu.A.; SHERSTYUK, A.A.; KURBATOV, M.I.

Effect of phosphorus on the cold brittleness of high manganese  
steel. Lit.proizv. no.7:21-22 J1 '64.

(MIRA 18:4)

SHUL'TE, Yu.A., doktor tekhn. nauk; VOLCHOK, I.P., inzh.

Effect of calcium on the properties of medium-carbon steel.  
Mashinstroenie no.2:56-58 Mr-Ap '65. (MIRA 18:6)

SHUL'YE, Yu.A., doktor tekhn. nauk; LUNEV, V.V., inzh.

Effect of complex reduction on the cold resistance of medium  
carbon cast steel. Mashinostroenie no.3:18-20 My-Je '65.  
(MIRA 18:6)

SHUL'YE, Yu.A., doktor tekhn.nauk; PARASYUK, P.F., inzh.; SHERSTYUK, A.A., inzh.;  
MIKHAYLOV, P.A., inzh.; KURBATOV, M.I., kand.tekhn.nauk; BERKUN, M.N.,  
inzh.

Increasing the durability of high-manganese steel castings.  
Mashinostroenie no.4:57-58 J1-Ag '65. (MIRA 18:8)

GABUYEV, G.Kh.; YEL'TSOV, K.S.; SHUL'TE, Yu.A.; MIKHAYLOV, P.A.; GAREVSKIY, I.A.;  
LEYBENZON, S.A.; TSIVIRKO, E.I.; MEDOVAR, B.I.; LATASH, Yu.V.; FRANTSOV,  
V.P.; PAKHOMOV, A.I.; KAGANOVSKIY, G.P.; VOINOV, S.G.; SHALIMOV, A.G.;  
KALINNIKOV, Ye.S.; SMOLYAKOV, V.P.; KOSOY, L.F.

Improving the quality of electric-slag-refined bearing steel. Stal'  
24 no.7:640-642 J1 '64. (MIRA 18:1)

1. Zavod "Dneprospetsstal", Zaporozhskiy mashinostroitel'nyy institut,  
Institut elektrosvarki im. Ye.O.Patona i Tsentral'nyy nauchno-issledo-  
vatel'skiy institut chernoy metallurgii imeni I.P.Bardina.

VOLCHOK, I.P., inzh.; SHUL'TE, Yu.A., doktor tekhn. nauk

Complete deoxidation of medium-carbon steel. Lit. proizv. no.9:26-28  
S '65. (MIRA 18:10)

SHUL'TE, Yu.A., LUNEV, V.V.; BERKUN, M.N.; VOLCHOK, I.P.; GLADKIY, S.I.

Effect of structural dispersity on the properties of medium  
carbon cast steel. Fiz.-khim. mekh. mat. 1 no.2:218-220 '65.  
(MIRA 18:6)

1. Mashinostroitel'nyy institut im. V.Ya. Chubarya, Zaporozh'ye.



SHUL'IN, Yu.A.; VOLCHOK, I.P.; LUNEV, V.V.; RUDENKO, V.P.

Effect of complex deoxidation on the physicommechanical properties  
of medium-carbon steel. Fiz.-khim. mekh. mat. 1 no.5:563-566 '65.  
(MIRA 19:1)

1. Mashinostroitel'nyy institut imeni Chubarya, Zaporozh'ye i  
Fiziko-mekhanicheskyy institut AN UkrSSR, L'vov. Submitted  
Feb. 25, 1965.

ACC NR: AP7006798

SOURCE CODE: UR/0418/66/000/006/0058/0060

AUTHOR: Shul'te, Yu. A. (Doctor of technical sciences); Lunev, V. V. (Engineer); Grechanyy, A. P. (Engineer)

ORG: None

TITLE: Increasing resistance to cold shortness in alloy steels used for castings

SOURCE: Tekhnologiya i organizatsiya proizvodstva, no. 6, 1966, 58-60

TOPIC TAGS: alloy steel, impact strength, plastic strength, cast steel, *FERRITE STEEL, PEARLITE STEEL*

ABSTRACT: The authors consider the effect of complex reduction on the mechanical properties and resistance to cold shortness of alloyed ferrite-pearlite steels. The grades of steel studied were 25ML with the composition (in %) 0.23-0.28 C, 0.55-0.75 Mn, 0.2-0.3 Si, 0.024-0.634 S, 0.027-0.030 P, 0.4-0.55 Mo and 0.027-0.040 Al, and 30KhNML with the composition (in %) 0.28-0.35 C, 0.52-0.68 Mn, 0.23-0.27 Si, 0.032-0.040 S, 0.33-0.38 P, 1.42-1.56 Cr, 1.30-1.50 Ni, 0.25-0.35 Mo and 0.030-0.035 Al. The effect of calcium and cerium additives on the mechanical properties and cold shortness of these grades of steel was studied. Aluminum alone, aluminum combined with silicon-calcium alloy and a combination of silicon-calcium alloy, aluminum and ferrocerium were used as reducing agents. It was found that complex reduction increases strength and ductility with a simultaneous reduction in the critical tempera-

Card 1/2

UDC: 669.15:620.192.42.004.68

ACC NR: AP7006798

ture of embrittlement. The effect of calcium modification alone approaches that of triple modification by aluminum, calcium and cerium. All specimens showed a smooth reduction in impact strength from +20 to -100°C without the jump characteristic of steel with pronounced cold shortness thresholds. The yield stress of 25ML steel falls with a temperature reduction until it reaches the value of the tensile strength at -196°C. Due to the favorable effect of nickel, 30KhNML steel retains a fair amount of ductility even at this temperature. The experimental data show that the resistance of ferrite-pearlite alloy steels to cold shortness may be considerably increased with a concomitant improvement in the purity of the metal. Orig. art. has: 4 figures, 1 table.

SUB CODE: 11/ SUBM DATE: None/ ORIG REF: 004

Card 2/2

SHULTIN, A. A.

SHULTIN, A. A. : "Investigation of the infra-red spectra of crystals with complex ions." Leningrad Order of Lenin State U imeni A. A. Zhdanov. Leningrad, 1956. (Dissertation for the Degree of Candidate in Physicomathematical Science)

Source: Knizhnaya Letopis' No. 28 1956 Moscow

SHULTIN, A. A.

20-4-15/60

AUTHORS:

Gross, Ye. F. Corresponding Member AN USSR

Shultin, A. A.

TITLE:

The Interaction Between Intermolecular and Lattice Vibrations in Crystals According to the Data of Infrared Spectra (Vzaimodeystviye vnutrimolekulyarnykh i reshetochnykh kolebaniy kristallov po dannym infrakrasnykh spektrov).

PERIODICAL:

Doklady Akad. Nauk SSSR, 1957, Vol. 115, Nr 4, pp. 689-692 (USSR)

ABSTRACT:

At first reference is made to the present state of the problem and to some earlier papers. The problem of the interaction of phonons with the intermolecular vibrations is of great interest. Therefore the author examines the infrared absorption spectra of monocrystalline samples of  $\text{Ba}(\text{NO}_3)_2$  and  $\text{Pb}(\text{NO}_3)_2$ . It was the purpose of these investigations to clear up the problem of the existence and the peculiarities of the "compound" transitions (whose intensities are markedly dependent on temperature). The probability of such transitions must also depend on the type of the inner-ionic excitation and on the type of lattice vibrations. In the crystals selected here the composed  $\text{NO}_3^-$  - ions play the part of structural units which have internal degrees of freedom. These ions are plane equilateral triangles having the nitrogen atom in the center. Such a system has 6 normal vibrations with frequencies in the range 700- 1500  $\text{cm}^{-1}$ . The samples of lead nitrate

Card 1/3

The Interaction Between Intermolecular and Lattice Vibrations in Crystals According to the Data of Infrared Spectra. 20-4-15/60

ASSOCIATION: Leningrad State University imeni A.A.Zhdanov (Leningradskiy gosudarstvennyy universitet imeni A.A.Zhdanova)

SUBMITTED: March 23, 1957

AVAILABLE: Library of Congress.

Card 3/3

57-28-4-26/39

AUTHORS: Gross, Ye. F. , Abolin'sh, Ya. Ya. , Shultin, A. A.

TITLE: On the Observation of the Optico-Acoustic Effect in a Liquid (O nablyudenii optiko-akusticheskogo effekta v zhidkosti)

PERIODICAL: Zhurnal Tekhnicheskoy Fiziki, 1958, Vol. 28, Nr 4, pp. 832-835 (USSR)

ABSTRACT: The authors here started from the idea whether it was not possible to utilize the optico-acoustic phenomenon for the determination of the duration of existing states of excitation in the molecules of liquids and solids and to work out a method of investigation for condensed systems on the basis of this phenomenon. From these considerations experiments were performed in the authors' laboratory. In these experiments the optico-acoustic phenomena in liquids and solids were observed. In the course of these experiments in the year 1952, which were repeated in 1957 such phenomena were observed in water, methyl alcohol and ethyl alcohol. A perceptible signal was only obtained in a small

Card 1/3

57-28-4-26/39

On the Observation of the Optico-Acoustic Effect in a Liquid

range of the modulation frequencies at about 200 cycles. The optimum modulation frequency at which the acoustic signal attains its maximum value depends on the geometric dimensions of the chamber and on the frequency-characteristic of the microphone whose membrane touches the liquid. The spectral dependence of the optico-acoustic signal was observed in liquid ethyl alcohol. The signal was observed in the domain of from  $\lambda = 0,95 \mu$  to  $4 \mu$ , where the maximum amplitude was attained at  $\lambda = 2 \mu$ . A comparison of the experiments with analogous ones in which a gas had been investigated shows that the acoustic signal forming in liquids is many times weaker than that forming in gases. By a certain perfection of the scheme it will be possible to use the principle of the gas analyzer by Veyngérov also for an analysis of liquids. At present the experiments for the observation of optico-acoustic phenomena in crystals are continued. There are 3 figures, and 7 references, 5 of which are Soviet.

Card 2/3



On the Observation of the Optico-Acoustic Effect in a Liquid

57-28-4-26/39

ASSOCIATION: Leningradskiy gosudarstvennyy universitet  
(Leningrad State University)

SUBMITTED: October 29, 1957

Card 3/3

SOV 57-23-10-22-40

2464  
 AUTHOR: Gross, E. F., Volin'sh, Ya. Ya., Shultin, A. A.  
 TITLE: Optical-acoustic Effect in Crystals (Optiko-akusticheskiy efekt v kristallakh)  
 JOURNAL: Zhurnal tekhnicheskoy fiziki Vol 28, Nr 10, pp 2255-2258 (USSR) 1958  
 ABSTRACT: The experiments, of which this paper gives an account, for the determination of the optical-acoustic effect were performed according to a scheme used in work with fluid substances (Ref 1). These experiments substantiated the existence of such an effect in crystal. It appears from the information gained that a utilization of this effect in the investigation of the solid state of a substance is dependent on another ways and means are found of improving the experimental technique and the instrument sensitivity. This paper also covers experiments on piezoelectric properties, a Rochelle-salt crystal serving as a sample. The oscillograms obtained demonstrate that the optical-acoustic effect in Rochelle-salt crystals is very intensive and comparable to the optic-acoustic effect in gases. It was found that the optic-acoustic effect also occurs in a free Rochelle-salt crystal, which is not clamped down. The intensity in both cases,

Card 1/2

Optical-acoustic effect in Crystals

NOV/57-29-10-22/40

the clamped down and the free one, is the same. In explanation of this effect is advanced and it is assumed that the effect in both cases is due to the same causes. It was also found that the intensity of the optical-acoustic effect gradually decreases after connecting the light source. This is considered to be due to a general increase in temperature of the whole crystal and the gradual approach of the upper Curie point. The optical-acoustic effect in the crystal of Rochelle-salt is so intensive that it can be used for the solution of a number of problems. The experiments described in this paper are at present continued by investigating the spectral distribution of the optical-acoustic effect in Rochelle-salt crystals and in other ferroelectric substances. The experiments presented in this paper are only the first stage of investigations of the optical-acoustic effect in crystals. There are 3 figures and 7 references, 6 of which are Soviet.

RECEIVED: July 7, 1958

2/2

- Optical-Acoustic Effect in Crystals

SOV/57-28-10-22/40

Card 3/3

24(2)

AUTHOR:

Shultin, A. A.

SOV/20-125-4-21/74

TITLE:

The Influence Exercised by the Crystal Lattice Field on the Vibration of Ions  $\text{NO}_3^-$  (or  $\text{CO}_3^{--}$ )

From the Data of the Infrared Spectra of Sodium Nitrate and Calcite (Vliyaniye polya kristallicheskoy reshetki na kolebaniya ionov  $\text{NO}_3^-$  (ili  $\text{CO}_3^{--}$ ) po dannym infrakrasnykh spektrov nitrata natriya i kal'tsita)

PERIODICAL:

Doklady Akademii nauk SSSR, 1959, Vol 125, Nr 4, pp 767-770 (USSR)

ABSTRACT:

The author investigated the spectra of monocrystalline plates of amorphous  $\text{NaNO}_3$  - and  $\text{CaCO}_3$  (calcite-) crystals, in order to explain the influence exercised by the crystal lattice upon the vibrational spectrum of the  $\text{NO}_3^-$  (or  $\text{CO}_3^{--}$ )-group.

Production of the samples is briefly discussed. The absorption spectra were recorded in unpolarized light. The spectra of the samples orientated parallel to the optical axis apparently contain all transitions active in the given

Card 1/3

The Influence Exercised by the Crystal Lattice  
Field on the Vibration of Ions  $\text{NO}_3^-$  (or  $\text{CO}_3^{--}$ )

SOV/20-125-4-21/74

From the Data of the Infrared Spectra of Sodium Nitrate and Calcite

frequency interval. Analysis of the selection rules for the vibrations of the ions  $\text{NO}_3^-$  (or  $\text{CO}_3^{--}$ ) in the crystal lattices of the calcite type leads to the following conclusion: In spite of the splitting up of the oscillation system into 2 components (as a result of the resonance interaction of the ions of the crystal), the character of the infrared spectrum of the crystal does not undergo any qualitative modification compared to the spectrum of a single ion. The spectra recorded are shown by 2 diagrams. The basic oscillation  $\nu_4(E')$  of the ion occurs in form of a rather narrow band with the frequency range of  $713 - 728 \text{ cm}^{-1}$ . The frequency range  $1300 - 1600 \text{ cm}^{-1}$  is taken up by a broad and intense absorption band. Various possibilities of explaining the existence of several peaks are declared to be useless. Apparently, the anomalous structure of the oscillation band  $\nu_2$  is connected with the

Card 2/3

The Influence Exercised by the Crystal Lattice  
Field on the Vibration of Ions  $\text{NO}_3^-$  (or  $\text{CO}_3^{--}$ )

SOV/20-125-4-21/74

From the Data of the Infrared Spectra of Sodium Nitrate and Calcite

strong resonance interaction of ion oscillations in the excited lattice (the symmetry of which is lower than that corresponding to equilibrium). The author thanks Ye. F. Gross, Corresponding Member, AS USSR, for his interest in this work and for his valuable advice. There are 2 figures, 2 tables, and 8 references, 3 of which are Soviet.

ASSOCIATION: Leningradskiy gosudarstvennyy universitet im. A. A. Zhdanova  
(Leningrad State University imeni A. A. Zhdanov)

PRESENTED: January 2, 1959, by A. A. Lebedev, Academician

SUBMITTED: December 25, 1958

Card 3/3

37909

S/054/62/000/002/005/012  
B163/B138

9,2180

AUTHORS: Abolin'sh, Ya. Ya., Sokolova, M. M., Shultin, A. A.

TITLE: The spectral distribution of the opto-acoustic effect in Seignette's salt in the region  $2000-6000 \text{ cm}^{-1}$

PERIODICAL: Leningrad. Universitet. Vestnik. Seriya fiziki i khimii, no. 2, 1962, 66-68

TEXT: Earlier experiments by Gross, Abolin'sh, and Shultin (ZhTF, 28, 2255, 1958) on the observation of the opto-acoustic effect with intermittent white light are extended to an investigation of its spectral distribution. A crystal plate (X-cut) of Seignette's salt is irradiated with modulated infrared radiation from a global radiation source through a prism-spectrometer MKC-6 (IKS-6) with a rock salt prism as monochromator. Electric charges appear on the faces perpendicular to the X-section when the crystal is irradiated. The corresponding voltage, which varies with the modulation frequency, is amplified and the spectrum of the opto-acoustic signal is recorded with a potentiometer MCP 1-01 (PSR 1-01). The spectrum is corrected for the spectral intensity distribution of

Card 1/4 2



S/054/62/000/002/005/012  
B163/B138

The spectral distribution of the ...

the radiation source. It has some distinct maxima which correspond to optical excitations of intramolecular oscillations. This interpretation is consistent with the assumption that the opto-acoustic effect is due to non-radiative transitions from optically excited intramolecular oscillations to the lattice. The table gives an interpretation of the maxima in the spectrum of the opto-acoustic signal. There are 2 figures and 1 table.

SUBMITTED: January 29, 1962

Card 2/2

ABOLIN'SH, Ya.Ya. [Abolins, J.]; SOKOLOVA, M.M.; SHULTIN, A.A.

Spectral distribution of the optical-acoustic effect in Rochelle  
salt crystals within the region 2000-6000 cm.<sup>-1</sup>. Vest.LGU 17  
no.10:66-68 '62. (MIRA 15:5)  
(Rochelle salt—Spectra) (Crystal optics)

L 8969-66 ENT(1)/ENT(m)/I/ENP(L)/ENP(D) IJR(C) JD

ACC NR: AP5027433

SOURCE CODE: UR/0181/65/007/011/3424/3426

AUTHOR: <sup>44,55</sup> Karpov, S. V.; <sup>44,55</sup> Shultin, A. A.

ORG: Leningrad State University (Leningradskiy gosudarstvennyy universitet)

TITLE: <sup>44,55</sup> Infrared spectra of <sup>27</sup>potassium <sup>27</sup>nitrate during phase transitions

SOURCE: Fizika tverdogo tela, v. 7, no. 11, 1965, 3424-3426

TOPIC TAGS: phase transition, potassium compound, nitrate, <sup>21,44,55</sup>IR spectrum, single crystal

ABSTRACT: The infrared spectra of oriented single crystals of potassium nitrate are studied in polarized light to obtain data on phase transitions in this compound. Contrary to theoretical predictions, the  $\nu_1$  band in phase II is most intense in spectra where the electrical radiation vector is parallel to crystal axes  $b$  and  $c$ . In addition to this, there are a number of absorption bands in the spectrum caused by composite transitions with lattice vibrations taking part. These bands are completely polarized in the (001) plane. An unexpected absorption band was observed in phase I near  $\nu = 1055 \text{ cm}^{-1}$ . The  $\nu_1$  band in this phase is polarized in plane (001). All internal vibrations of the nitrate ions are observed in the  $\text{KNO}_3$ -III spectrum. Some tentative theoretical explanations are given for the observed phenomena. A more detailed discussion of the experimental results will be published later. Orig. art. has: 2 figures.

SUB CODE: 20/

SUBM DATE: 01Jun65/

ORIG REF: 004/

OTH REF: 016

Card 1/1 *pu*

L 14077-66 EWT(1)/EWP(e)/EWT(m)/T/EWP(t)/EWP(b) IJP(c) JD/WH

ACC NR: AP6003484

SOURCE CODE: UR/0020/66/166/001/0063/0066

AUTHOR: Gomon, G. O.; Shultin, A. A.

ORG: Leningrad State University im. A. A. Zhdanov (Leningradskiy gosudarstvennyy universitet)

TITLE: <sup>21, 44, 55</sup>Infrared absorption spectra of <sup>16</sup>diamonds with various physical properties

SOURCE: AN SSSR. Doklady, v. 166, no. 1, 1966, 63-66

TOPIC TAGS: diamond, IR absorption, absorption spectrum, luminescence

ABSTRACT: Infrared absorption spectra were studied in diamonds which displayed distinguishing features with respect to luminescence, absorption in the ultraviolet region of the spectrum, color and other properties in an attempt to clarify the nature of individual absorption bands. A clear relationship is established between absorption of diamonds at about 8  $\mu$  and absorption in the ultraviolet region of the spectrum: diamonds which are transparent in the ultraviolet region at 2250-2700 Å are transparent in the infrared region at 8  $\mu$ . Diamonds which are transparent in the 2800-3100 Å region (with a group of bands at 3020-3300 Å in their absorption

Card 1/2

UDC: 535.342 + 548.0:535

L 14077-66

ACC NR: AP6003484

spectra) also show absorption in the region near  $8 \mu$ . Apparently the centers responsible for absorption at about  $3000 \text{ \AA}$  also cause absorption near  $8 \mu$ . These centers do not form after the diamonds are irradiated by protons or neutrons, or after radiation and subsequent heat treatment. Thus they are not defects in the crystal lattice of the diamond since these may be formed by such action. It might be supposed that these centers are due to impurities in the diamonds. However, the authors were unsuccessful in identifying the form of the impurity with those previously identified in diamonds. These phenomena were not observed in diamonds which have a singular structure in the yellow-green component of the luminescence spectrum. The absorption at about  $8 \mu$  may be due to transitions between levels responsible for the luminescence lines at  $4890$  and  $5203 \text{ \AA}$  and are not associated with absorption in the ultraviolet region. No relationship was established between the absorption near  $8 \mu$  and the intense blue and yellow-green luminescence of diamonds ( $415$  and  $503 \text{ m}\mu$ ). Orig. art. has: 1 figure, 1 table.

SUB CODE: 20/ SUBM DATE: 27Apr65/ ORIG REF: 004/ OTH REF: 006

  
Card 2/2

00

9

**Effect of tin and copper on chemical stability of cast iron.** V. V. SKORCHILNII and A. I. SHULIN. *Sposobiye Vsesoyuznogo Inst. Metal.* 1931, No. 12, 33-7. The effect of Sn and Cu, separately and combined, on chem. stability, particularly on resistance to acids, also on mech. properties of cast iron, was studied. The samples investigated had the compn.: C 3.5, Si 1.5, Mn 0.8 and max S + P 0.5%. To this was added 2.0% Sn in one case, 1.00% Cu in another and a total of 3.5% Sn + Cu in a third case. Chem. stability of the samples was detd. by immersion in HNO<sub>3</sub>, H<sub>2</sub>SO<sub>4</sub>, HCl and AcOH, 10 and 20% solns. Samples contg. Sn + Cu were also tested in 20% NaOH soln. The results of all the tests were expressed in terms of loss of wt. of the samples in g. per sq. m. surface per hr. Addn. of Sn lowers somewhat mech. strength of the iron and affects its resistance to acids as follows: in 10 and 20% HNO<sub>3</sub> chem. stability increases 2.25 and 2.0 times, resp.; in 10 and 20% H<sub>2</sub>SO<sub>4</sub> 0.6 and 2.5 times; in 10 and 20% HCl, 2.3 and 1.3 times, and in 10 and 20% AcOH 3 times, as compared with Sn-free cast iron. Addn. of Cu increases somewhat the strength of the metal and affects chem. stability as follows: it increases in 10 and 20% HNO<sub>3</sub>, decreases in H<sub>2</sub>SO<sub>4</sub> and increases 2 times in AcOH, when the Cu added is about 0.4%. Above this it decreases. In 10 and 20% HCl Cu increases chem. stability 6.1 and 4.5 times, resp. As to Sn + Cu, 1.3% Sn and 1.5% Cu seem to give the best results. Further addns. do not improve the product. However, in HNO<sub>3</sub> a total of Sn + Cu = 3.5% produces a favorable effect.

S. I. MADORSKY

AS 6-55.4 - METALLURGICAL LITERATURE CLASSIFICATION

CO 9

Experiments on the removal of arsenic from metal. V. V. SKORCHELEKTI AND A. I. SHUL'IN. *Sovetskii Vsesoyuznyi Inst. Metal.* 1931, Nos. 3-4, 67-71. The problem consisted in giving the As in the molten metal bath a chance to form with some element a strong compd. which would be insol. in the metal. As dearsenicizers were tried: Ca metal, Si-Ca alloy contg. Si 62.97, Ca 27.79 and Fe 5.98%, Si-Al-Ca alloy contg. Si 54.27, Ca 21.58, Al 8.02 and Fe 12.58%. Ca forms a compd. with As,  $Ca_2As_3$ , insol. in Fe. Steel contg. 0.18% As was melted and dearsenicized in batches of 100-700 g. and the products were tested chemically and mechanically. When Ca alone was used, the addn. of 0.1-1.47% Ca gave a removal of 0.55-5% As. With Si-Ca alloy, addn. of 0.1-1% Ca gave a removal of 0.16-0% As. With Si-Al-Ca alloy the addn. of 1% Ca gave a removal of 17.6-55.5% As. Simple remelting without dearsenicizers produced no effect on the As content of the metal. Theoretically it requires 0.25% Ca to remove 0.25% As, but in practice more is required because of the oxidation of part of the Ca. Other dearsenicizers, such as Pb + 10% Na and  $CaCl_2$ , were also tried, but these were less effective in the case of pig iron. In the case of steel, addn. of  $CaC_2$  had a decided effect. S. L. MATKORSKY

Lead in gun-bronze melts. H. P. SHELTON AND A. L. SHELTON. *Sovetskoye Inzh. Metal.* 1931, Nos. 3-4, 70-80. A study of the literature has shown that structural distribution of Pb in gun-bronze has a decided effect on mech. properties of the bronze. A brittle complex appears in the alloy, which lowers its mech. strength, and the use of Pb to the extent of more than 8.9% should be avoided. In order to eliminate undesirable segregations a thermal treatment of the bronze at 600-700°C for a period of 4-6 hrs. is recommended.

ASH 55A METALLURGICAL LITERATURE CLASSIFICATION



**Preparation of cupola cast iron alloyed with tin and copper.** V. V. Skovcheletskii and A. I. Slutskii. *Nashikh chlenov Vsesoyuznogo Izd. Metal.* No. 8, 1959 (1959). The Cu and Sn, in the form of an alloy (Sn/Cu = 2/1), are introduced in the ladle. The cast iron is added and thoroughly mixed with the alloy. The product should contain C around 3.6, Si about 1.5, Mn 0.5% and as little as possible of S and P. S is especially harmful. The casting quality of cast iron alloyed with Sn and Cu is not inferior to that of ordinary cast iron. Sn-Cu cast iron is exceptionally resistant to dil.  $H_2SO_4$  (10%) at room temp. The alloyed cast iron may be used in the manufact. of articles which are not subjected in the course of their use to special strains. H. Cohen.

H. Cohen

A 50 514 METALLURGICAL LITERATURE CLASSIFICATION

ca

9

Processes and Properties in...  
 Chromium stainless cast iron. V. V. Skorobelletti, A. I. Shultin and V. I. Naumov. *Metallurg* 8, No. 4-5, 23-36 (1963).—Forty-seven alloys contg. C 0.9-4.0, Si 0.8-4.5 and Cr 26-37% were prepd. and tested for phys. properties and corrosion resistance. Micrographs show the eutectic structure at 2.4% C in an alloy contg. 30% Cr. Alloys contg. C 2.0-2.8, Si 1.3-1.4, Mn 0.5 and Cr 34-5% resist corrosion very well in oxidizing solns. but are rapidly attacked in reducing solns., have high mechanical properties, especially in bending tests and can be satisfactorily machined despite their high hardness (about 350 Brinell). These alloys showed a loss in wt. in 60% hot HNO<sub>3</sub> of 1.84-2.37 g. per sq. m. per hr. as compared to 1.37 g. for Krupp V2A steel (18-8). H. W. Rathmann

ASB 31.4 METALLURGICAL LITERATURE CLASSIFICATION

*Cf*

**Chromium-manganese stainless steels.** A. I. Shultis. *Metallog*, No. 4-5, 37-70(1933).—Corrosion tests of steels contg. Cr 18, Mn 4-16 and Ni 2-8% show that in general Mn cannot be satisfactorily substituted for Ni in Cr-Ni stainless steels. However, steels contg. Cr 18, Mn 8 and Cu 2%, as well as Cr 18, Mn 8, Ni 2 and Cu 2% are considerably superior to 18 Cr-8 Ni steels in solns. of  $(\text{NH}_4)_2\text{SO}_4 + \text{H}_2\text{SO}_4$  and in the contact process for producing  $\text{HNO}_3$ . Intercryst. corrosion of these steels is somewhat less than that of 18-8 steels. Stampability and other phys. properties are as good as in 18-8. Micrographs show a structure of ferrite and austenite, Mn widening the 2-phase field in these steels. H. W. R.

COMMON ELEMENTS		PROCESSES AND PROPERTIES INDEX		COMMON ELEMENTS													
<p>*Resistance of Alloys to Pit-Water. A. I. Shultin and V. M. Shpeizman (Rep. Central Inst. Metals (Leningrad), No. 17, 1634, 222-233; C. Abs., 1035, 20; 5401).—[In Russian, with German summary.] In studying the resistance of metals in sulphuric acid solution (<math>p_H = 1</math>), under conditions similar to those in pumping mine water through pipes, 3 kinds of metals were investigated: (1) grey cast iron with small amounts of phosphorus, copper, tin and copper, antimony and copper, molybdenum or molybdenum and copper; (2) special alloys of the Monel type, Nimol, Ni-Resist, and stainless high-chromium cast-iron; (3) bronzes. The last were used for comparison. In group (1) the most resistant metals were tin-copper and antimony-copper cast iron samples; however, these were not so good as the bronzes. In (2) the most resistant was stainless chromium cast-iron, which was many times more resistant to corrosion than the bronzes. Tests were also made with natural pit-water.—S. G.</p>																	
ASR-5LA METALLURGICAL LITERATURE CLASSIFICATION																	
<table border="1"> <thead> <tr> <th colspan="2">GROUPS</th> <th colspan="2">SUBGROUPS</th> <th colspan="2">SUBSUBGROUPS</th> </tr> </thead> <tbody> <tr> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td> </tr> </tbody> </table>						GROUPS		SUBGROUPS		SUBSUBGROUPS		1	2	3	4	5	6
GROUPS		SUBGROUPS		SUBSUBGROUPS													
1	2	3	4	5	6												

1ST AND 2ND GROUPS

PROCESSES AND PROPERTIES INDEX

2

Influence of Supersonic Waves on Liquid (Metal) Phases. A. I. Shultin and P. M. Kornilov (*Sobremennye Zentrallnogo Instituta Metallov (Comm. Centr. Inst. Metals)*, 1936, (10), 131-144).—[In Russian.] An apparatus for producing supersonic waves is described. When metals and alloys with a low melting point (e.g. bismuth, 50:50 antimony-bismuth, 60:40 bismuth-cadmium, and 42:58 lead-bismuth alloys) are allowed to solidify under the influence of supersonic waves, the grain-size is reduced and the grains become equiaxed; such metal shows an increased plasticity.—A. R. F.

METALLURGICAL LITERATURE CLASSIFICATION

E-2

1ST AND 2ND GROUPS

Stability of metals in plants producing chlorine gas and sodium alkylate. A. I. Shultin and I. A. Koryakova. *Korrozii i Berba*, No. 1, 2, 126-37 (1939). Exptl work is reported. Under conditions of the reaction between  $\text{HNO}_3$  (d. 1.42) and  $\text{NaCl}$  in the mol. ratio 3:1, at  $100^\circ$  in both the gas and the liquid phases Silux (cast iron contg. 15.76% Si) and Mosilux (cast iron contg. 15.3% Si and 3.8% Mo) are entirely resistant. Chromex (2.30% Si and 31.06% Cr) has good resistance. The  $\text{HNO}_3$  forms a protective film that is not destroyed by  $\text{Cl}_2$  or  $\text{NO}_2$ . The moisture content was high in the gas phase above the reaction medium. Dry  $\text{NOCl}$  at  $100^\circ$  is more corrosive than dry  $\text{Cl}_2$ ;  $\text{NOCl}$  at this temp. forms compds. of the type  $\text{MCl}_2\text{NOCl}$  and  $\text{MClNOCl}$  with most metals (except Ni, Mg and possibly Cr). The most resistant is Ni steel. Mosilux is next. Silux and Chromex, resistant to moist gases, are highly corroded by dry gases. At room temp.  $\text{NOCl}$  causes little loss of wt. in Silux and Mosilux in 100 hrs. Pure dry  $\text{Cl}_2$  is much less corrosive than pure moist  $\text{Cl}_2$  at  $100^\circ$ . At  $0^\circ$  liquid  $\text{NOCl}$  is highly corrosive. Chromex alloy is comparatively resistant, and pure Ni entirely resistant. Conc'd.  $\text{HNO}_3$  and  $\text{HCl}$  (3:1) at  $60^\circ$  are much more corrosive than  $\text{HNO}_3$  and  $\text{NaCl}$  at  $100^\circ$ . Still, even under these conditions, Chromex and Mosilux are sufficiently stable. Silux is unreliable. The products of corrosion absorb moisture forming a brown-reddish liquid. They dissolve in  $\text{H}_2\text{O}$  with evolution of oxides of N, free  $\text{Cl}_2$  and  $\text{N}_2$ . The solid (a yellow-red crust) is composed of  $\text{Fe}_2\text{O}_3$ ,  $\text{FeCl}_3$  and  $\text{SiO}_2$ . Ni and Cr steel and Hastelloy A cannot be used for equipment construction in plants producing chlorine. C. S. Shapiro

*M* *2*

**Composition of Chemically Resistant Alloy.** A. I. Shultin (*Gosudarst. Inst. Prikladn. Khim., Sbornik Statei, 1919-1939, 1939, 241-267; C. Abn., 1941, 35, 1307*). [In Russian.] An analysis is given of the chief theoretical conditions for determination of the composition of a chemically resistant alloy. In order to build a resistant alloy on a non-resisting base it is necessary to resort to alloying. The amount of alloy element resistant under these conditions should reach at least the ratio of 1:8 mols. The preparation of a resistant alloy on an unstable base by the addition of small amounts of alloy component is impossible. If a sufficiently stable passivating film is present on the alloy or metal surface, it is possible further to improve the resistance by secondary electrochemical exchange. This exchange can be accomplished by the addition of 0.5-3% of a more noble component than the base. 35 references are given.

ASA-3LA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND CODES																										3RD AND 4TH CODES																									
PROCESS AND PROPERTIES INDEX																																																			
ca																										9																									
<p>Role of secondary electrochemical exchange in the chemical stability of metallic alloys. I. A. I. Shultin and B. P. Artamonov. Gosudarst. Inst. Prikladnoi Khim., Sbornik Statei 1919-39, 268-89 (1939).—Exptl. data indicate that the presence of ions of Cu, Ag or Hg in <math>H_2SO_4</math> or in formic acid causes a sharp decrease in rate of corrosion of Cr and Cr-Ni steels. In this instance the potential of steel as a rule reaches the magnitude of the potential of the noble metal. The value of the potential of the steel and its change with the concn. of ions of the noble metals as well as the condition of the corroded surface indicate that the noble metal is being placed in the pores and defective sections of the passivating film. As a result of this the addnl. destruction of the alloy is hindered. The essential requirement for the pos. effect of secondary electrochem. exchange on the stability of the alloy is the presence on the alloy of a passivating film and the absence of direct interaction between the film and the anion in soln. The interaction between <math>Cl^-</math> and the oxide film is apparently the cause of neg. effect of secondary electrochem. exchange on the stability of steels in HCl.</p> <p style="text-align: right;">B. Z. Kamich</p>																																																			
ASR-SLA METALLURGICAL LITERATURE CLASSIFICATION																																																			
MATERIALS INDEX																										AUTHOR INDEX																									
1ST AND 2ND LETTER																										3RD AND 4TH LETTER																									



*ca*

Chemical stability of some metallic alloys in manufacture of hydrogen peroxide. I. A. Kosyakova and A. I. Shultin. Gosudarst. Inst. Prikladnoi Khim., Sbornik Statei 1910-30, 290-304 (1939).—Russian-made Cr, Cr-Ni, Fe-Si and Pb alloys were tested as substitutes for glass and ceramic app. in the manuf. of H<sub>2</sub>O<sub>2</sub> from H<sub>2</sub>S<sub>2</sub>O<sub>8</sub>. Yield of H<sub>2</sub>O<sub>2</sub> was decreased by 6-8% owing to soln. of metal. Rate of catalytic decompn. of H<sub>2</sub>O<sub>2</sub> was twice as large as on glass but in contact with the H<sub>2</sub>O<sub>2</sub> a film was formed and the catalytic activity dropped nearly to that of glass. The losses of metal are given.

B. Z. Kamich

CA

4

THEORY OF THE CORROSION OF METALS IN SOLUTIONS. I. A. I. Shultin. *J. Phys. Chem.* (U. S. S. R.) 15, 350-40 (1941). A possible mechanism of soln. of metals without localized oxidation and reduction is described. A cathode, as an independent phase, is necessary only in the case of high energies of activation. The  $H^+$  concn.--oxidation-reduction potential diagrams of the systems Cu-H<sub>2</sub>O and Fe-H<sub>2</sub>O are considered, and the stability of a metal or alloy is found to depend on the nature of the metal, the pH and the potential. The corrosion process is best considered as an electrochemical exchange-reaction. II. *Ibid.* 370-81.--Consideration of polarization curves leads to the conclusion that electrochemical corrosion-exchange can take place without participation of microgalvanic couples; the difference in effect is the result of applied polarization and does not indicate the presence of micro-couples. The kinetics of corrosion are in general governed by the kinetics of electrode processes rather than by Ohm's law. P. H. Rathmann

AS A - 51 A METALLURGICAL LITERATURE CLASSIFICATION

10

9

TEST AND INSPECTION PROCESSES AND PROPERTIES INDEX

The mechanism of the effect of alloying elements (Cu, Ag, Mo) on the chemical stability of acid-resisting Fe base alloys. B. P. Artamonov and A. I. Shultin. *Trudy Vsesoyuznogo Nauchno-Issledovatskogo Instituta Korrozii Metallov*, 80, 103 (1943). Specimens of steel contg. (1) C 0.10, Cr 17.8, Ni 0.01 and Si 0.81; (2) C 0.12, Cr 18.67, Ni 0.21, Si 0.46 and Mn 0.21; (3) C 0.10, Cr 25.47, Ni 0.23, Si 0.43 and Mn 0.23; (4) Cast Fe contg. C 0.60 and Si 15.64%; and (5) electrolytic Fe were tested for corrosion and electrode potential in 2 N solns. of  $H_2SO_4$ ,  $HCOOH$  and  $HCl$  to which small quantities (0.01-0.3 equiv./l.) of Cu, Ag, Hg, Pt, or Mo ions had been added. The presence of these ions in  $H_2SO_4$  and  $HCOOH$  greatly decreased the rate of corrosion and the potential of the steel specimen became approx. the same as the potential of the added metal. In  $HCl$  the addn. of the metal ions increased the rate of corrosion and resulted in a potential value between electrolytic Fe and the added metal. The protective action of the ions in  $H_2SO_4$  and  $HCOOH$  results from the deposition of the metal in the pores of the passive layer (e.g., of Cr mols.) formed on the surface of corrosion-resistant alloys. If such a layer is not formed, as in  $HCl$  soln., the addn. of ions electrong. to Fe will increase the rate of corrosion. H. W. R.

CD 9

THEORY AND PROPERTIES OF METALS

Theory of the corrosion of metals in solutions III.  
 Solution potential of metals. A. I. Shul'man. *J. Phys. Chem.* (U.S.S.R.) 18, 61-8(1911); cf. *C.A.* 36, 6110C.  
 From the equation of the polarization curves, on the assumption that the surfaces were equipotential, the consumption potential of the system Ni-Fe in soln. was detd. Exptl. data on Ni and Fe in various concns. of acids, chlorides, phosphates, sulfates, oxalates, citrates, and acetates are shown graphically. IV. Kinetics of the solution of metals. *Ibid.* 10, 25. From the equation for the reduction potential of a dissolving metal and the equation for the rate of a cathode reaction is derived  $i = K_0[H^+]^2$  for the rate of solution of metals in dil. acids. For concd. acids the equation is  $\ln i = K_1 + P_1[H^+]$ , whence, generally,  $\ln i = K_1 + L_1 \ln [H^+] + P_1[H^+]$ .  
 P. H. Rathmann

1ST AND 2ND ORDERS										3RD AND 4TH ORDERS									
PROCESSES AND PROPERTIES INDEX																			
<p>Phase relations in the system aqueous solution-metal. A. I. Shust'kin. <i>J. Applied Chem. (U.S.S.R.)</i> 20, 730-53 (1947) (in Russian).—Trends of electrochem. (oxidation-reduction) reactions in aq. solns. are analyzed on the basis of a "state diagram" of <math>H_2O</math>, represented in the form of a plot of the oxidation-reduction potentials <math>E</math> against the pH. It consists of 2 parallel lines of <math>E</math>, the lower for the equil. potential of <math>H_2</math>, the upper for <math>O_2</math>. The area between the 2 lines is the field of stability of <math>H_2O</math>. Imposition of a system requiring <math>E(pH)</math> values lying outside that field, must result in decompos. of <math>H_2O</math>; consequently, aq. solns. of strong oxidants or of weak reducing agents cannot be stable. On similar grounds, oxidation-reduction potentials corresponding to the existence in soln. of only the oxidized or the reduced form, are unrealistic on inert electrodes, as the other form will necessarily be formed through reaction with <math>H_2O</math>. Latimer's equil. potential data permit calcul. of the equil. concns. of various products of reduction of <math>O_2</math> stable in aq. solns.; these, the permissible equil. concn. of perhydroxyl <math>HO_2</math> is <math>10^{-10.5}</math> moles/l. The method further permits treatment of the trends of reactions between metals and aq. solns., equil. being, in all cases, detd. by all potentials involved, including the oxidation-reduction potential of the medium of the given pH.</p> <p style="text-align: right;">N. Thon</p>																			
<p>ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION</p>																			
<p>RECORD DIVISION</p>										<p>RECORD DIVISION</p>									
<p>RECORD DIVISION</p>										<p>RECORD DIVISION</p>									

SHULTIN, A. I.

Regarding the order of magnitude of different kinetic factors entering into the corrosion process. A. I. Shultin. Zhur. Priklad. Khim. 29, 217-28 (1956).—Math. analysis of

the several factors entering into the corrosion process leads to the conclusion that ohmic resistance of the aggressive soln. plays a minor part (less than 1%) and that the application of Ohm's law even when corrected for e.m.f. is not warranted. The controlling factors are chem. and concn. polarization effects and diffusion. An analysis of the oxidation-reduction rates as functions of the metal potential simplifies the concept of corrosion.

I. Hencowitz

2/ SH

SHULTIN, A. I.

The order of magnitude of different kinetic factors entering into the corrosion process. A. I. Shultin. *J. Appl. Chem. U.S.S.R.* 29, 241-51 (1955) (Engl. translation). See *Met. E.* C.A. 50, 12789i. B. M. R.

SHULTIN, A. I.

✓ Kinetics of corrosion processes. A. I. Shultin. *Zhur. Priklad. Khim.* 20, 359-76 (1955); cf. *C.A.* 30, 12789i. —  
The corrosion process of a metal or an alloy in an aq. electrolyte is an electrochem. oxidation-reduction process, the driving force of which is the change in free energy between the initial and final states.  $\Delta F$  is given as a sum of the several potentials entering the process. The potential drop due to ohmic resistance is a negligible factor (cf. *loc. cit.*). The potential of the metal of the cathode, unless the products of reduction in the electrolyte contain its ions, does not affect  $\Delta F$ . It affects only the rate of the potential rise. The same is true of impurities which act catalytically, increasing the rate but not the final results. I. B.

Metal

1

of



SHULTIN, A. I.

✓ Kinetics of corrosion process. A. I. Shultin. *J. Appl. Chem. U.S.S.R.* 29, 407-14 (1956) (Engl. translation). See *Metal*  
C.A. 50, 13702a. B. M. R.

SHULTIN, A. I.

4

Chem  
Met

10355\* (Russian.) Rate of Cd Oxidation in Nitric Acid.  
O skorosti okisleniya medi v azotnoi kislothe. N. N. Miliutin  
and A. I. Shultin. Zhurnal Prikladnoi Khimii, v. 30, Jan. 1957,  
p. 58-60.  
Oxidation rates in  $\text{HNO}_3$  of various concentrations is expressed  
quantitatively by the equation:  $\phi = 0.195 + 0.056 \ln c$ .  
Increase of temperature accelerates the oxidation process.

Phy  
MT

SHULTIN, A. I.

<sup>27</sup>  
Oxidation of copper in aqueous solutions of potassium  
dichromate-sulfuric acid. N. N. Milyutin and A. I. Shultin. Zhur. Priklad. Khim. 30, 340-32(1957); *ibid.*  
G.A. 51, 10207c. The rate  $v$  of soln. of Cu in solns. of  $K_2Cr_2O_7$

$Cr_2O_7$  in  $N H_2SO_4$  was detd. at  $25^\circ$  as a function of the potential. In the concn. range of  $0.011-0.100M$   $K_2Cr_2O_7$  the potential rose within the first 2-3 min. and then became stationary,  $\varphi$ . In the concn. range of  $0.200-0.440M$  the potential dropped rapidly during the first 10-15 min. to  $\varphi$ . The plot of  $\log v$  vs.  $\varphi$  for dil. solns. (up to  $0.100M$ ) was a linear function expressed by  $\varphi = 0.195 + 0.058 \log v$  which was similar to that of oxidation by  $HNO_3$  (*loc. cit.*), i.e. in the absence of distorting influences the oxidation of Cu was detd. by the polarization and was independent of the precathodic processes. Above  $0.100M$   $K_2Cr_2O_7$ ,  $\varphi$  did not follow the linear relation. This was attributed to the formation, at high pH, in the precathodic layer, of poorly sol. products. This retarding effect could not be removed by stirring but was removed by increasing the concn. of  $H_2SO_4$  to  $3N$  and the temp. to  $35^\circ$ . The plot of  $\log t$  vs.  $\varphi$  for the oxidation of Cu in solns. of  $K_2Cr_2O_7$  and  $HNO_3$  was a linear function expressed by  $\varphi = 0.265 + 0.058 \log v$ . I. B.

fm fra  
MT

S/081/60/000/010/004/009  
A166/A129

AUTHORS: Pavlovskaya, N.N.; Shultin, A.I.

TITLE: The electrochemical behavior of nickel in sulfuric acid and ferric sulfate solutions

PERIODICAL: Referativnyy zhurnal. Khimiya, 1960, no. 10, 76, abstract 38104.  
(Uch. zap. Leningr. gos. ped. in-ta im. A.I. Gertsena, 1959, v. 160, no. 1, 207 - 219)

TEXT: Anode polarization curves were plotted for Ni in  $H_2SO_4$  [1; 2 N.] and 2 N.  $H_2SO_4 + Fe_2(SO_4)_3$  [1; 2 and 4.4 N.] solutions in a range from +0.250 to +2.055 v (n.v.e.). The anode polarization curves consist of two sections divided by the passive state area ( $\sim 1.5$  v). In solutions of varied composition the curves coincided well with each other. Comparison of the anode current density ( $i_a$ ) with the weight losses of the electrode in 1 N.  $H_2SO_4$  showed that in the first section of the anode polarization curve the current is consumed entirely in dissolving Ni. When  $i_a = 65 - 70$  ma/cm<sup>2</sup> in 1 N.  $H_2SO_4$ , Ni passivation occurs; in the presence of  $Fe_2(SO_4)_3$  this effect is observed at lower  $i_a$  values. The second section of the curve corresponds to liberation of  $O_2$ . When the anode polariza-

Card 1/2

S/081/60/000/010/004/009  
A166/A129

The electrochemical behavior of nickel in....

tion curve is plotted in reverse (from the higher to the lower  $i_a$  values) hysteresis is observed upon transition from the second section to the first. The rate of self-solution ( $i_c$ ) in solutions of 1 N.  $H_2SO_4 + xFe_2(SO_4)_3$  ( $x = 0.18 - 7.2$  N.) was determined from the sample's weight loss. It was found that when the concentration of  $Fe_2(SO_4)_3 < 3.84$  N.  $i_c$  increases in proportion to  $Fe_2(SO_4)_3$  concentration. Maximum  $i_c$  occurs in a 3.84 N.  $Fe_2(SO_4)_3$  solution. Any further increase in the  $Fe_2(SO_4)_3$  concentration is accompanied by a drop in  $i_c$ . In a 7.2 N.  $Fe_2(SO_4)_3$  solution  $i_c = 0$ , but the electrode potential approaches the redox potential of the solution. On the basis of the low temperature coefficient of  $i_c$  and the strong effects of intermixing, the authors conclude that, in the presence of  $Fe_2(SO_4)_3$ ,  $i_c$  is limited by the oxidizer's diffusion rate. It was found that in the media studied both self-solution and solution during anode polarization were subject to a single electrochemical mechanism; at a temperature of 25°C these processes can be described by the equation  $\varphi = 0.381 \pm 0.047 \lg i$ .

V. Knyazheva

[Abstracter's note: Complete translation]

Card 2/2

LEVIN, A.I.; MINTIN, N.N.

Passivity of metallic materials. Zhur. prikl. khim. 37 no.6:1261-  
1267 Je '64. (NIRA 18:3)

SHUL'TS, A. (Sverdlovsk)

Photography in the range of 0.5 to 0.75 m. Sov. foto 19  
no. 6:63 Je '59. (MIRA 12:9)  
(Photography)

P

COUNTRY : USSR  
 CATEGORY : GENERAL & SPEC. ZOOLOGY. INSECTS  
 ABS. JOUR : Insect and Mite Pests. 16262  
 : Ref Zhur-Biologiya, No. 4, 1959, No.  
 AUTHOR : Shul'ts, A. A.  
 INST. : Inst. of Biol., AS Latvian SSR  
 TITLE : Lepidoptera of Gardens and Truck Gardens of  
 : Latvian SSR.  
 ORIG. PUB.: Tr. In-t biol. AN LatvSSR, 1958, 5, 45-68

ABSTRACT : Of 108 species harmful to berry fruit planta-  
 tions of Latvia, the most injurious were the  
 gooseberry moth, the winter moth and orange  
 moth, currant borer, apple-fruit miner and  
 Argyresthia ephipella, lackey moth, leopard  
 moth, Cacoecia rosana and fruit-tree leafroller,  
 Laspronia padellus, and Pandoris ribeana. Of  
 20 species found on vegetables, the most har-  
 ful were the cabbage white butterfly and the  
 turnip butterfly, cutworm Euxoa segetum, Fly-

CARD: 1/2

28



VAKHER, A.I., inzh.; SHUL'TS, A.K., inzh.

Unit for lubricating steel cables. Mekh. stroi. 18 no. 6:16-17  
Je '61. (MIRA 14:7)  
(Wire rope) (Lubricants and lubrication)

SHUL'TS, A.L.; TSYGANOV, G.A.

Disociation coefficient in simultaneous discharge of nickel  
and hydrogen ions. Izv. AN Uz. SSR Ser. khim. nauk no.2:33-46  
'57. (MIRA 11:8)  
(Dissociation) (Nickel) (Hydrogen)

Shul'ts, A.L.

Distr: 4E2c/4Eh3

✓ Depassivating effect of chlorides during anodic solution of nickel. A. L. Shul'ts and G. A. Tsyganov. Doklady Akad. Nauk USSR, S.S.R. 1954, No. 9, 33-7; Referat. Zhur., Khim. 1955, Abstr. No. 54732. The process of anodic soln. of Ni in the presence of chlorides and H atm. is studied by taking the polarization curves (PC) at definite electrode potentials. To the basic electrolyte with a compn.  $\text{NiSO}_4 \cdot 7\text{H}_2\text{O}$  140,  $\text{Na}_2\text{SO}_4 \cdot 10\text{H}_2\text{O}$  100,  $\text{H}_3\text{BO}_3$  20, is added  $\text{NaCl}$  0.5-20 g./l. The measurements are made at 25° and pH 5. At low chloride concns., with the increase of the c.d. 4, 5 regions are observed on the PC corresponding to the following processes: anodic soln. of Ni with preserved surface activity; gradual formation of film; formation of a phase oxide causing passivation; dissolving the Ni through the film of passivating oxides; evolution of  $\text{O}_2$ . At a concn. of 5-20 g./l. of chlorides, the last process is absent while the 2nd and 3rd are preserved. This indicates that the chlorides do not impede the formation of the passivating oxide film on the Ni surface. According to the authors, the depassivating effect of the chlorides is connected with their ability to facilitate the anodic soln. of Ni through the passivating oxides.

N. Vasileff

SOV/137-58-8-17455

Translation from: Referativnyy zhurnal, Metallurgiya 1958. Nr 8, p 179 (USSR)

AUTHORS: Shul'ts, A.L., Tsyganov, G.A.

TITLE: Polarization During the Electrolytic Deposition of Nickel in the Presence of Additives in the Electrolyte (Polyarizatsiya pri elektroosazhdenii nikelya v prisutstviu dobavok k elektrolitu)

PERIODICAL: Izv. AN UzSSR. Ser. khim. n., 1957. Nr 4. pp 41-53

ABSTRACT: The effect of additions of KCNS,  $\text{Na}_2\text{S}_2\text{O}_3 \cdot 5\text{H}_2\text{O}$ , and thio-urea introduced into the nickel electrolyte ( $\text{NiSO}_4 \cdot 7\text{H}_2\text{O}$ , 1N;  $\text{Na}_2\text{SO}_4 \cdot 10\text{H}_2\text{O}$ , 100 g/liter,  $\text{H}_3\text{BO}_3$ , 20 g/liter) on polarization in the electrolytic deposition of Ni was studied. It was established that the polarization curve of the electrolytic deposition of Ni in general consists of three sectors, one with predominance of the separation of Ni, one with evolution of  $\text{H}_2$ , and one with the establishment of a stationary potential of the Ni electrode in the given electrolyte. The introduction of additives into the electrolyte affects the position and shape of the said sectors of the polarization curve and, therefore, affects the position and shape of the polarization curve of the electrolytic

Card 1/2

SOV/137-58-8-17455

Polarization During the Electrolytic Deposition of Nickel (cont.)

deposition of Ni. Anion-type additives (KCNS,  $\text{Na}_2\text{S}_2\text{O}_3 \cdot 5\text{H}_2\text{O}$ ) cause the displacement of the sector of the polarization curve relative to the electrolytic deposition of Ni corresponding to the process of the predominant separation of Ni in the direction of less negative values of the potential. Additives of the molecular type (thiourea) displace this sector of the polarization curve of electrolytic deposition of Ni towards the more negative values of the potential. The effect of the additives in the electrolyte on the polarization during the electrolytic deposition of Ni is explained by their adsorption on the surface of the cathode, as a result of which complementary ionic and dipolar layers are formed on the cathode-electrolyte interface which promote or impede the processes. Bibliography: 39 references.

L.A.

1. Nickel--Electrodeposition
2. Electrolytes--Properties
3. Nickel--Polarization

Card 2/2

SHUL'TS, A.L.; TSYGANOV, G.A.

Sulfur containing additives used in electrolytic solutions from which nickel is deposited as a cathodic reduction product. Dokl. AN Uzb. SSR no.3:35-39 '58. (MIRA 11:6)

1. Institut khimii AN UzSSR. Predstavleno akademikom AN UzSSR S.Yu. Yunusovym.

(Nickel plating)

BUKINA, V.K.; SHUL'TS, A.L.; KONONENKO, N.I.

Microanalytical determination of sulfur in galvanic deposits of  
nickel. Dokl. AN Uz. SSR no.6:27-29 '58. (MIRA 11:9)

1. Institut khimii AN UzSSR. Predstavleno akademikom AN UzSSR  
M.N. Nabiyevim.

(Nickel plating) (Sulfur) (Microchemistry)

SHUL'TS, A. L.: Master Chem Sci (diss) -- "Some problems of the kinetics and mechanism of the electro-precipitation of nickel". Tashkent, 1959. 14 pp (Acad Sci Uzbek SSR, Inst of Chem), 200 copies (KL, No 17, 1959, 106)



SHUL'TS, A.L.

Third conference on the electrochemistry of organic compounds.  
Uzb. khim. zhur. no.1:95 '61. (MIRA 14:1)  
(Electrochemistry--Congresses)

SHUL'TS, A.L., kand. khim. nauk, otv. red.; EYDEL'MAN, A.S., red.

[Simultaneous electrode reactions] Sovmestnye elektrodnye reaktsii. Tashkent, Izd-vo AN UzSSR, 1962. 142 p.

(MIRA 15:11)

1. Akademiya nauk Uzbekskoy SSR. Tashkent. Institut khimii.  
(Electrodes) (Electrolysis)

36932. 1949, s. 13.

36932. Indoposobleniya po usloviy terapii dlya raneniykh i bol'nykh s porazheniyem tsentral'noy i perifericheskoy nervnoy sistemy, razrabotannyye i primenennyye v Institute nevrologii Akademii meditsinskikh nauk SSSR. V sb: Nevrologiya voyen. vremeni. T. II. M., 1949, s. 300-13.

SO: Letopis' Zhurnal'nykh Statey, Vol. 50, Moskva, 1949

SHUL'TS, A.Sh., inzh.

Group call system. Avtom. telem. i sviaz' 8 no.9:22-24  
S '64. (MIRA 17:10)

COUNTRY : USSR  
 CATEGORY : Diseases of Farm Animals. Diseases Caused  
 by Helminths  
 ABS. JOUR. : RZhBiol., No. 6 1959, No. 25992  
 AUTHOR : Shul'ts, B. D.  
 INST. : Omsk Veterinary Institute  
 TITLE : Experiment in the Use of Tansy in Nematodiasis  
 of Horses  
 ORIG. PUB. : Sb. stud. nauchn. rabot. Omskiy vet. in-t, 1957,  
 vyp. 2, 65  
 ABSTRACT : A decoction of dried raceme of tansy (Tanacetum)  
 was tried on three horses as an anthelmintic.  
 Excretion of a considerable number of nematodes,  
 the species of which is not indicated, was ob-  
 served in horses.-- N. V. Denidov.

CARD: 1/1

22

KHAZANOV, Ye.I.; SHUL'TS, B.V.

Kinetics and mechanism of the reduction of ilmenite and  
titanium-magnetite by carbon at sintering temperatures.  
Titan i ego splavy no.5:85-94 '61. (MIRA 15:2)  
(Titanium ores)  
(Ore dressing)

S/200/61/000/011/003/005  
D202/D304

AUTHORS: Khazanov, Ye. I. and Shul'ts, B.V.

TITLE: Reduction of titanomagnetite by sintering with a solid reducing agent

PERIODICAL: Akademiya nauk SSSR. Sibirskoye otdeleniye. Izvestiya, no. 11, 1961, 98-102

TEXT: In the present work the authors studied the reduction of synthetic titanomagnetite on samples obtained by the fusion of pure  $\text{Fe}_2\text{O}_3$  and  $\text{TiO}_2$  in an atmosphere of CO. They found that by sintering this mixture at 1200°, only ilmenite was formed. Fusion at 1500°C yielded a product consisting of two distinct phases: that of ilmenite and that of titanomagnetite. Only the last phase was magnetic and its chemical composition was as follows: (%):  $\text{TiO}_2 = 4.89$ ,  $\text{Fe}_2\text{O}_3 = 63.44$ ,  $\text{FeO} = 30.6$ ,  $\text{Fe} = 0.22$ . X-ray crystallographic data showed it to be similar to those of the natural mineral. Its chemical analysis was performed by A.I. Kapustina,

Card 1/2

Reduction of titanomagnetite ...

S/200/61/000/011/003/005  
D202/D304

and its X-ray examination by S.A. Stakheyeva. This magnetic portion of the fusion product was used by the authors for their experiments by heating the product with pure charcoal in the temperature range 1000 - 1300°C. It was found that at lower temperatures, up to 1100°C, mostly iron oxides were reduced, the reduction of titanium oxide being very slight. With rising temperature the rate of iron oxide reduction was lowered owing to the formation of anosovite. It follows that for industrial purposes the reduction of ferrotitanic concentrates should be carried out at possibly low temperatures. The authors propose a following scheme for the reduction process:  $(Fe_3O_4 \cdot FeO \cdot TiO_2; FeO \cdot TiO_2) + C = mFeO \cdot nTiO_2 \cdot pTi_2O_3 + Fe + CO$ , the ratios  $m : n : p$  depending on temperature. These conclusions were checked on natural ores. An addition of 20% soda facilitated the oxide reduction. There are 4 figures, 2 tables and 13 Soviet-bloc references.

ASSOCIATION: Vostochno-Sibirskiy filial sibirskogo otdeleniya AN SSSR, Irkutsk (East Siberian Branch of the Siberian Department AS USSR, Irkutsk)

SUBMITTED: September 14, 1960

Card 2/2



KHAZANOV, Ye.I.; KUZ'MINA, G.V.; STAKHEYEVA, S.A.; SHUL'TS, B.V.

Changes in the phase composition of clays during heating in a neutral atmosphere in the presence of a solid reducing agent. Trudy Vost.-Sib. fil. AN SSSR no.43:69-76 '62. (MIRA 16:3)

(Aluminum oxide)

(Clay)

(Phase rule and equilibrium)

SHUL'TS, B.Yu.; FISHER, Ye.B. [Fisher, IE.B.]

Automatic system for feeding proportioned raw materials.  
Khar.prom. no.1:89-90 Ja-Mr '62. (MIRA 15:8)  
(Proportioning equipment) (Automatic control)

MAVRIN, I.; SHUL'TS, D.O., red.; LEVINA, I.G., tekhn.red.

[Obtaining 216 eggs per laying hen] 216 isits ot nesushki.  
Moskva, Izd-vo M-va sel'.khoz.RSFSR, 1960. 39 p.

(MIRA 14:1)

(Eggs--Production)

TULAYKOV, Nikolay Maksimovich, akademik (1875-1937); SHUL'TS, D.O.,  
red.; SAYTANIDI, L.D., tekhn. red.

[For row crop cultivation and against grassland farming] Za  
propashnye kul'tury protiv travopol'ia; izbrannye stat'i.  
Moskva, Izd-vo MSKh RSFSR, 1962. 159 p. (MIRA 15:9)  
(Tillage)

SHAUTSUKOV, Zalim-geri, kand. sel'khoz. nauk, zasl. agronom RSFSR;  
SHUL'TS, D.O., red.; SAYTANIDI, L.D., tekhn. red.

[Mechanized tillage of corn fields without manual work]  
Mekhanizirovannaia obrabotka posevov kukuruzy bez primene-  
niia ruchnogo truda. Moskva, Izd-vo MSKh RSFSR, 1963. 119 p.  
(MIRA 16:7)

(Corn (Maize)) (Tillage)

SHUL'TS, E., inzhener (g.Sochi).

Using coarse porous concrete blocks in building apartment houses  
in Sochi. Gor. i sel'. stroi. no.1:19-21 Ja '57. (MLRA 10:4)  
(Sochi--Apartment houses)  
(Concrete blocks)

SHUL'TS, E.A.

Analysis of a video signal for studying its transitory  
characteristic. Elektrosviaz' 16 no.10:30-37 0 '62.  
(MIRA 15:9)  
(Television--Transmitters and transmission)

SOV/97-59-3-11/15

AUTHORS: Ochinitskiy, V. I., Architect, Sidorov, A. S. Engineer and  
Shul'ts, E. E. Engineer

TITLE: New Truss Construction

PERIODICAL: Beton i zhelezobeton, 1959, Nr 3, pp 136-137 (USSR)

ABSTRACT: The truss construction described and illustrated in this article is made up of three separate units (Figs 1 and 2) which are reinforced by welded reinforcement skeleton consisting of three 4 mm diameter longitudinal bars and cross-reinforcement of 3 mm diameter bars spaced 25-30 cm apart. In the bottom frame two 10 mm diameter rods are left protruding for later fixing of the ceiling. Individual parts of the truss are joined together by cement grout mark 100. The trusses are cast on concreting yard KPP of the Sochnispetsstroy. The frames can be placed in position without cranes as the heaviest unit weighs only 60 kg. The table on p 137 gives consumption of concrete and steel for trusses used for a house with 28 apartments. In comparison with

Card 1/2



SOV/97-59-3-11/15

New Truss Construction

steel trusses they require only one-third of the volume of concrete and one-sixth of the weight of steel. The trusses are cast in steel forms on vibrating tables. There are 2 figures and 1 table.

Card 2/2

KOCHERGIN, N.A.; KAGANSKIY, I.M.; SHUL'TS, E.Z.

Use of towers with perforated downcomerless plates for the removal of carbon dioxide from gases by means of the monoethanolamine solution. Khim.prom. no.11:866-869 '63. (MIRA 17:4)

1. Lisichanskiy filial Gosudarstvennogo nauchno-issledovatel'skogo i proyektnogo instituta azotnoy promyshlennosti i produktov organicheskogo sinteza.

SHUL'TS, G.

SAPCZHNIKOV, A. A., ZAMORSKIY, A. D., FINDEYZEN, V., and SHUL'TS, G., "Experimental Study of the Formation of Ice Particles in the Atmosphere," No 1, pp 96-97.  
(Meteorologiya i Gidrologiya, No 6 Nov/Dec 1947)

SO: U-3218, 3 Apr 1953

SHULTS, G.

"Sanitarnaya i Protivo-Epidemicheskaya rabota v SSSR," 1951, 48 pages

SHUL'TS, G. (g.Stalinabad)

In memory of M.I.Matveev (1902-1954). Bot.zhur.41 no.2:298-299 F '56.  
(Matveev, Mikhail Ivanovich, 1902-1954) (MIRA 9:7)

SHUL'TS, G. E. S

USSR/Geography  
Climatology

Sep/Oct 1947

PA 34T29

"Periods during which leaves fall in the Northern as well as Southern Parts of the USSR," G. E. Shul'ts, 8 pp

"Izv Vsesoyuz Geog Obshch" Vol XLIX, No 5

In autumn the fall of leaves is one of the basic indicators of seasonal change in the majority of geographical zones, but the geographical regularity of this phenomenon is very little studied. Author attempts to show that there is some relationship between fall of leaves and geographical location. He uses as his examples the fall of the leaves of the birch and the

LC

34T29

USSR/Geography (Contd)

Sep/Oct 1947

bilberry. His geographical areas range from Murmansk to Kalinin, including Central Asia.

34T29

SHUL'TS, G. E.

Shul'ta, G. E. - "The periods of leaf drop of certain types of woody plants of Tadzhikistan", Soobshch. Tadzh. filiala Akad. nauk SSSR, Issue 13, 1949, p. 17-19.

SO: U-411, 17 July 53, (Letopis 'Zhurnal 'nykh Statey, No. 20, 1949).

SHUL'TS, G.E.

36772. K voprosu o roli azota i fosfora v razvitii khlopchatnika Soobshch. Tadzh. filiala Akad. nauk SSSR, vyp. 18, 1949, c 3-7--- Bibliogr: s. 7

SO: Letopis' Zhurnal'Nykh Statey, Vol. 50, Moskva, 1949



STUDY, P. 1.

"The Reaction of Trees and shrubs to an Uninterrupted Summer Day," 66, No. 5, -1949-.

SHUL'TS, G.E.

Determining conditions of mineral nourishment of the cotton plant on the basis of external features. Trudy TFAN SSSR 18:63-89 '51.

(Cotton) (Plants, Effect of minerals on)

(MLRA 8:8)

SHUL'TS, G. E.

"The Progress of Wood Varieties in the High Latitudes in Connection With Continuous Summer Days." Cand Biol Sci, Inst of Botany imeni V. L. Komarov, Acad Sci USSR, Leningrad, 1955. (KL, No 7, Feb 55)

SO: Sum. No. 631, 26 Aug 55-Survey of Scientific and Technical  
Dissertations Defended at USSR Higher Educational Institutions  
(14)

SHUL'TS, G.E., kandidat biologicheskikh nauk (Leningrad)

April in the Central Tajikistan. Priroda 45 no.4:126-127 Ap '56.  
(MIRA 9:7)

1. Botanicheskiy institut Akademii nauk SSSR.  
(Tajikistan--Spring)

SHUL'TS, G.E.

November in Tajikistan. Priroda 45 no.11:124-125 N '56. (MLRA 9:11)

1. Botanicheskiy institut Akademii nauk SSSR, Leningrad.  
(Tajikistan--Autumn)

USSR / Cultivated Plants. General Problems.

M-1

Abs Jour : Ref Zhur - Biologiya, No 13, 1958, No. 58491

Author : Shulta, G. E.

Inst : Geographical Society USSR

Title : Phenologic Indicators of the Time for Agricultural Work

Orig Pub : Inform. byul. fenol: Geogr. o-va USSR, 1957, No 7, 5-7

Abstract : No abstract given

Card 1/1

SHUL'TS, G.E., kandidat biologicheskikh nauk.

In southern Central Asia. Priroda 46 no.1:125-126 Ja '57.  
(MLRA 10:2)

1. Botanicheskiy institut im. V.L.Komarova Akademii nauk SSSR,  
Leningrad.  
(Soviet Central Asia--Winter)

SHUL'IS, G. E.

"The Dynamics of Phenological Processes in European USSR in Dry Years,"<sup>p.101.</sup> in book  
Droughts in the USSR, Their Origin, Frequency, and Effect on Crops, Leningrad,  
Gidrometeoizdat, 1958. 206 p.

Agrometeorological Div., All-Union Plant Cultivation Inst.



SHUL'TS, G.E.

Phenological conference in Leningrad, Nov. 29 - Dec. 4, 1957.

Bot..zhur. 43 no.8:1229-1230 Ag '58.

(MIRA 11:9)

1. Botanicheskiy institut im. V.I. Komarova AN SSSR, Leningrad.  
(Phenology--Congresses)

AUTHOR: Shul'ts, G. E. 12-90-3-14/16

TITLE: A Phenological Conference (Fenologicheskoye soveshchaniye)

PERIODICAL: Izvestiya Vsesoyuznogo Geograficheskogo Obshchestva, 1958,  
Vol 90, Nr 3, pp 301 - 302 (USSR)

ABSTRACT: A Phenological Conference in Leningrad was convened in November 1957 by the USSR Geographical Society, together with the Institutes of Botany and Zoology of the AS USSR. There were 310 participants present, including representatives from all Soviet republics except Lithuania. The Conference heard 99 reports including those of: P.A. Baranov, (Member Correspondent AS USSR), I.N. Beydemann, and G.E. Shul'ts, on the actual stage of Soviet phytophenology; S.V. Kalesnik (Member Correspondent AS USSR), P.A. Baranov, A.I. Rudenko, (Leningrad - Candidate of Agricultural Sciences); Professor A.M. Shul'gin (Moscow), on "Phenology and Geography"; A.P. Vas'kovskiy (Magadan), on peculiarities of seasonal occurrences in the Chukotsk peninsula; V.D. Aleksandrova, (Leningrad - Candidate of Biological Sciences), on phenology of vegetation; B. Lyakhovskiy, T.N. Butorina, and Ye.A. Krutovskaya, on phenological seasons of the Siberian taiga; N.T. Nechayeva (Member-Correspondent of the AS Turkmen SSR), on the phenology of desert pastures in Turkmenia; Dotsent

Card 1/3

A Phenological Conference

12-90-3-14/16

M.A. Shabanov (Saratov), on the phenological division into districts of oblasts; V.A. Batmanov (Sverdlovsk), Dotsent B.S. Zhustov (Ryazan'), Dotsent A.Kh. Shklyar (Minsk), A.G. Remizov (Moscow), and others, on phenological maps; Ye.V. Bessonova (Leningrad) on maps showing the approach of seasonal phases in agriculture; A.F. Chirkova (Moscow) on terms of fox reproduction; N.K. Shipitsina, (Candidate of Biological Sciences (Moscow), on seasonal development of malarial mosquitoes; V.A. Batmanov (Sverdlovsk) on statistic methods of phenological cartography; Professor I.A. Gol'tsberg (Leningrad), Dotsent Ye.G. Mukhina (Odessa), D.F. Tumanova and N.S. Chochia (Candidate of Geographical Sciences - Leningrad), on phenological, micro- and macrological division into districts; N.N. Galakhov (Doctor of Geographical Sciences - Moscow), on the importance of phenological seasons in physico-geographical investigations; G.E. Shul'ts and Dotsent A.I. Shernin (Kirov), on the effect of long phenological series on secular climatic fluctuations; Professor G.G. Samoylovich and S.V. Belov (Candidate of Agricultural Sciences - Leningrad), on phenological conditions of woods observed by aerovisual reconnaissance and colored aerophotography; Professor A.M. Alpat'yev (Leningrad),

Card 2/3

A Phenological Conference

12-90-3-14/16

I.M. Beydeman, Professor A.P. Shimanyuk, T.M. Butorina and Ye.A. Krutovskaya (Krasnoyarsk), on correlations between rates of seasonal development of organisms and inorganic factors of surroundings. The Conference set up future methods to develop phenology in the USSR.

AVAILABLE: Library of Congress

Card 3/3

1. Phenology-USSR 2. Conferences-Phenology-Leningrad